# PUBLIC-SUPPLY PUMPAGE IN WISCONSIN, BY AQUIFER

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# FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM OF UNITS (SI)

For the convenience of readers who may want to use the International System of Units (SI), the data may be converted by using the following factors:

Multiply	Ву	To obtain
gallon (gal)	3.785	liter (L)
gallon per minute (gal/min)	$6.308 \times 10^{-5}$	liter per second (L/s)
foot	0.3048	meter (m)
million gallons (Mgal)	3,785	cubic meters (m <sup>3</sup> )

# PUBLIC-SUPPLY PUMPAGE IN WISCONSIN, BY AQUIFER

C. L. Lawrence, B. R. Ellefson, R. D. Cotter

### **ABSTRACT**

This report summarizes the amounts and distribution of the pumpage of ground water for public supplies from four aquifers in Wisconsin. The data are for 1979 and reflect the pumpage from about 1,100 wells in 485 communities. The distribution and amount of pumpage is estimated to be similar for subsequent years.

Of the water pumped for public supplies, 95 percent comes from two major aquifers--the sand-and-gravel and the sandstone aquifers. Lesser amounts of water come from the Silurian dolomite, which is present only in a narrow band in eastern Wisconsin, and from the generally low-yielding Precambrian basement rock that underlies the entire State.

#### INTRODUCTION

Water is an essential commodity for mankind and its survival. This may seem to be an overly simple and obvious cliche. However, it is easy to forget water's importance, when it is so readily and cheaply available. We expect an endless supply upon opening a faucet.

Wisconsin is fortunate in having an abundant supply of surface- and ground-water resources. The quality of the water in the State is generally good to excellent, although severe degradation has occurred in some local areas.

Ground water supplies the water needs of about 70 percent of the State's population. About half of the water pumped by public-supply systems in Wisconsin comes from ground water. The importance of maintaining and protecting this resource cannot be overestimated.

Three major water-bearing strata (aquifers) that yield fresh water to wells are present in Wisconsin (see section "Description of Aquifers"). The sandand-gravel, Silurian dolomite, and sandstone aquifers supply nearly all of the State's ground water. Of the water pumped for public supplies, 95 percent is from the sand-and-gravel and sandstone aquifers. About 5 percent is from the Silurian aquifer with less than 1 percent from Precambrian rocks.

This report was prepared as part of a cooperative program between the Wisconsin Department of Natural Resources and the U.S. Geological Survey. Studies conducted under this program, including data compilation, which began in 1978, are an element of a National Water Use Information Program.

#### **Purpose and Scope**

This report summarizes the amounts and locations of about 1,100 public-supply wells pumping from each of the four aquifers in Wisconsin in 1979. It also provides totals by county of quantities of water withdrawn. It is a guide not only to the source or aquifer from which individual communities obtain water, but also provides an understanding of the relative importance of the aquifers in Wisconsin regions.

This report does not consider all public-supply pumpage, only that from ground water. Almost all major cities located on the shores of the Great Lakes or on Lake Winnebago pump from the respective surface source. Data for 1979 are used because 1979 is the most recent year for which such detailed data has been tabulated (Lawrence and Ellefson, 1982) and entered into a State data base. Except in a few fast-growing communities, pumpage does not vary greatly from year to year.

### Acknowledgments

Robert Baumeister, Chief of the Public Water Supply Section of the Department of Natural Resources and members of his staff furnished information and assisted in data interpretaion essential in the preparation of this report.

### Methodology

The pumpage data in this report were tabulated from records in the files of the Wisconsin Department of Natural Resources (DNR). Each public water-supply system in the State is required to report pumpage by well to the DNR. A State computerized data base was established in order to more easily store, table, and total the reported data. Public supply pumpage by wells for 1979 is currently stored in this data base. A public water-supply system is defined as any water system that has at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

The U.S. Geological Survey maintains records on about 80 percent of all public-supply wells in Wisconsin in a data base called the Ground-Water Site Inventory (GWSI). Available information about each well including location, owner, water levels, and aquifer data is stored and continuously updated in GWSI. These data come from construction reports filed by the well drillers and from geologic samples analyzed by the Wisconsin Geological and Natural History Survey.

The water-bearing formations for most wells were identified from records in GWSI. More than 1,000 public-supply wells were analyzed to determine which geologic units were contributing water

to each well. Well-construction reports or other records were available for more than 800 of the wells. When no construction report or record was available, water levels, well depth, and formation thickness of nearby wells were used to determine the aquifers these wells penetrated. Where a well was open to more than one aquifer, pumpage was divided according to ratios estimated from records of public-supply wells penetrating more than one aquifer. The proportions follow:

Sand and gravel/Sandstone	=	10/1
Sand and gravel/Precambrian	=	10/1
Sandstone/Silurian	=	4/1
Sandstone/Precambrian	=	5/1

## **DESCRIPTION OF AQUIFERS**

Wisconsin's water-yielding rocks comprise three principal aquifers and one minor aquifer. The principal aquifers are the sand-and-gravel aquifer, the Silurian dolomite aquifer, and the sandstone aquifer; the minor aquifer is Precambrian bedrock (fig. 1).

The sand-and-gravel aquifer is a composite of innumerable sand-and-gravel deposits within the unconsolidated glacial sediments covering most of the State. Some of these deposits form broad surficial plains, others are buried lenses or channel fillings, and still others occupy present river valleys. Saturated deposits from 50 ft to more than 200 ft thick yield abundant water. Wells at Janesville in this aquifer have been test pumped at more than 5,000 gal/min.

AQUIFER	DOMINANT LITHOLOGY	THICKNESS (feet)	YIELD TO WELLS (gal/min)	AREAL EXTENT
Sand-and-gravel	Unconsolidated sand and gravel; variable amounts of silt, clay, and organic materials.	0 - 600 commonly 50 - 200	Small to large; commonly several hundred gallons per minute; more than 1000 gal/min in places.	
Silurian	Dolomite; some shale.	0 - 700 thickest along Lake Michigan	Small to moderate; several hundred gallons per minute in places.	
Sandstone	Sandstone and dolomite; some siltstone.	0 - 2700 thick in south; thickest in southeast	Small to large; largest yields commonly where thickest.	
Precambrian	Sandstone and shale; basalt; granitic and metamorphic rocks.	Thousands of feet	Commonly small; sandstone in northwest may yield a few hundred gallons per minute. Other rocks rarely yield 100 gal/min.	sandstone

Figure 1. Lithology, areal extent, thickness, and well yields of four of Wisconsin's aquifers.

The Silurian dolomite aquifer is composed of dolomite bedrock, a rock very similar to limestone. These rocks are an aquifer only along the east coast of the State. They dip to the east and thicken from their western edge to about 600 ft at Lake Michigan. This aquifer directly underlies the sand-and-gravel aquifer. Well yields are dependent on fractures and solution channels in this otherwise dense rock. The yield of a well depends on how many of these fractures or channels the well intersects, and on how much water the fractures carry. Well yields differ greatly over short distances, but usually do not exceed a few hundred gallons per minute.

The sandstone aquifer underlies the southern two-thirds of the State, and includes many rock formations--mostly sandstone and dolomite. It also includes beds of siltstone, and dolomitic and calcareous (containing calcium carbonate) sandstone. From north-central Wisconsin, these formations dip and thicken to the east, south, and west. In extreme southeastern Wisconsin, the sandstone aquifer is more than 2,700 ft thick. Yields from this aquifer depend on the type of rock penetrated by the well and on the total thickness penetrated. Many wells in eastern Wisconsin yield more than 1,000 gal/min.

The Precambrian aguifer is not a principal source of ground water in Wisconsin. Most of the rocks comprising this aquifer are dense crystalline rocks that yield little water; yields are from fractures, commonly near the bedrock surfaces. Precambrian rocks underlie the other aguifers throughout the entire State. They form the "basement" on which the overlying sedimentary rocks were deposited. These rocks are near land surface in central, northcentral, and northwest Wisconsin, but slope away from the surface to the south and east. Precambrian rocks in Wisconsin include many types, but the best aquifer is sandstone. Precambrian sandstone is present only in extreme northwestern Wisconsin, and yields up to 140 gal/ min to wells in Bayfield and Superior. Other Precambrian rocks commonly yield only a few tens of gallons per minute to wells.

#### **PUBLIC-SUPPLY PUMPAGE**

Tables 1-5 in this report show the 1979 pumpage for each public-supply well in the State. The tables are categorized as follows for each of the four principal aquifers:

Table 1--Sand and gravel aquifer

Table 2--Silurian aquifer

Table 3--Sandstone aquifer

Table 4--Precambrian aquifer

Table 5--Totals for all aquifers

The counties are arranged alphabetically and the wells alphabetically by name within each county.

The third column in each table is used to indicate wells that withdraw water from more than one of the four aquifers. For example, in table 1, La Crosse Well 14H in La Crosse County draws water from both the sand-and-gravel and the sandstone aquifers. Therefore a "3", which designates the sandstone aquifer, appears in the third column of table 1 and a "1", which designates the sand-andgravel aquifer, appears in the third column of table 3. The total pumpage from that and other multiaquifer wells is arbitrarily divided among the applicable aquifers in accordance with the ratios given in the "Methodology" section. As an example, the reported pumpage from La Crosse Well 14H in 1979 is 370 Mgal. Using the applicable ratio of 10:1, 337 Mgal is listed in table 1 and 33 Mgal in table 3.

Table 5 summarizes the pumpage by county and aquifer. Data for individual wells are not shown, but table 5 gives an overview of how much water is pumped from each aquifer by county, and gives State totals.

The locations of individual wells are plotted on separate aquifer maps (figs. 2-5).

Multiple aquifer wells are repeated on each appropriate aquifer map. In many cases where a community has several wells, for which exact locations are unknown, all wells have been given the same latitude and longitude for the center of the community and appear as a single mark on the applicable map. For example, the city of Abbotsford in Clark County has four wells in the sandand-gravel aquifer whose exact locations are unknown. They appear as a single location in figure 2.

The driftless, or unglaciated southwestern part of Wisconsin, is shown in figure 2. The only public-supply wells in the sand-and-gravel aquifer in this region are in the alluvial sediments of river valleys.

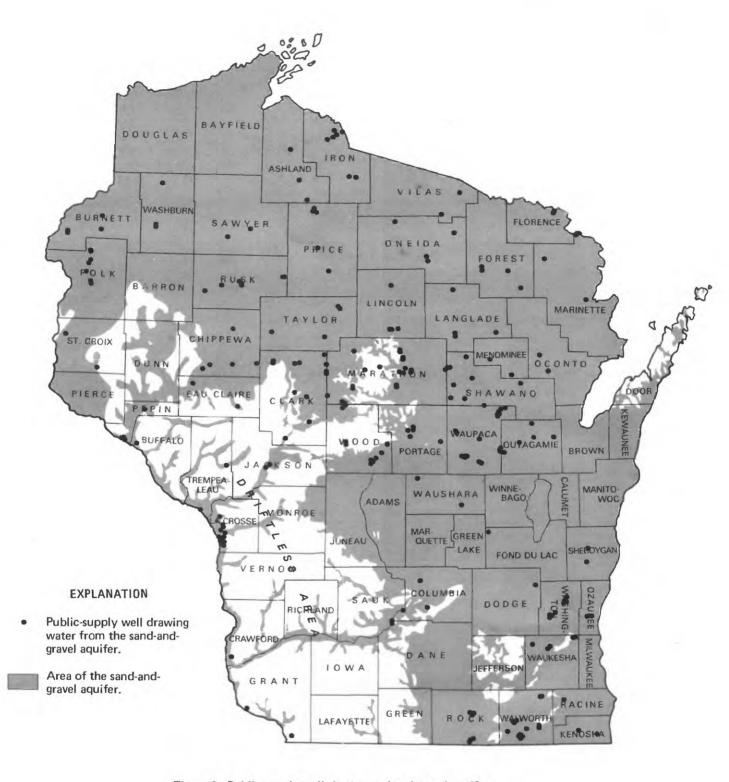


Figure 2. Public-supply wells in the sand-and-gravel aquifer.



Figure 3. Public-supply wells in the Silurian aquifer.

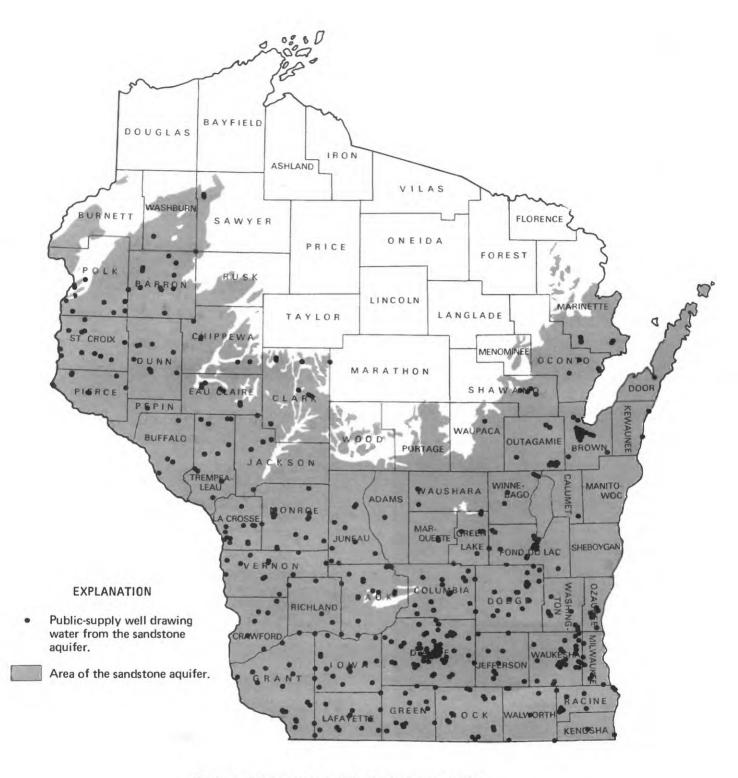


Figure 4. Public-supply wells in the sandstone aquifer.



Figure 5. Public-supply wells in the Precambrian aquifer.

#### SUMMARY AND CONCLUSIONS

This report presents a tabular and visual summary of the distribution of public-supply wells among four aquifers in Wisconsin. The data published in this report provide an understanding of the relative importance of the aquifers regionally in Wisconsin and can be useful for planning water development and protection.

Approximately 96,100 Mgal (table 5) of water were pumped for public supplies in 1979. Of this, 56 percent came from the sandstone aquifer and another 39 percent from the sand-and-gravel aquifer. This predominance of supply from these two

aquifers is also apparent from observation of figures 2-5. About 5 percent of public-supply pumpage is from the Silurian aquifer, which is available only along an eastern strip near Lake Michigan. Less than 1 percent is from the Precambrian aquifer. Most of the pumpage from the Precambrian aquifer is from wells that extend down into the Precambrian through other aquifers (multiaquifer wells).

#### REFERENCES

Lawrence, C. L., and Ellefson, B. R., 1982, Water use in Wisconsin, 1979: U.S. Geological Survey Open-File Report 82-444, 98 p.

TABLE 1. PUMPAGE FROM SAND-AND-GRAVEL AQUIFER IN 1979

COUNTY	OWNER ASSIGNED WELL IDENTIFICATION	TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	ANNUAL PUMPAGE IN MILLIONS OF GALLONS
ASHLAND	BUTTERNUT WELL 1 BUTTERNUT WELL 2		0.02 15.1
	GLIDDEN WELL 1		25.3
	MELLEN WELL 3		70.5
BUFFALO	NELSON WELL 1		10.9
BURNETT	GRANTSBURG WELL 1		2.73
	GRANTSBURG WELL 2		1.89
	GRANTSBURG WELL 3		43.4
	SIREN WELL 1		34.1
	WEBSTER WELL 1 AND 2		25.1
CHIPPEWA	CADOTT WELL 1		4.57
	CADOTT WELL 3		32.7
	CHIPPEWA FALLS WELL 2W		5.66
	CHIPPEWA FALLS WELL 1W		69.4
	CHIPPEWA FALLS WELL 1E		177
	CHIPPEWA FALLS WELL 2E		87.9
	CHIPPEWA FALLS WELL 3E CHIPPEWA FALLS WELL 4E		286 186
	CHIPPEWA FALLS WELL 4E CHIPPEWA FALLS WELL 5E		362
	CORNELL WELL 6		43.8
	STANLEY WELL 2		47.6
	STANLEY WELL 3		53.5
CLARK	ABBOTSFORD WELL 1		9.33
	ABBOTSFORD WELL 2		15.3
	ABBOTSFORD WELL 3		5.41
	ABBOTSFORD WELL 5		18.4
	COLBY WELL 2		11.4
	COLBY WELL 3		4.48
	COLBY WELL 4		12.0
	COLBY WELL 6		3.60
	COLBY WELL 12		1.73
	COLBY WELL GRANITE	4	5.65
	DORCHESTER WELL 3		17.4
	GRANTON WELL 4		8.86
	GREENWOOD WELL 1 AND 2 GREENWOOD WELL 6		11.2 5.63
	CREENMOOD MELL 3		
	GREENWOOD WELL 3		14.3
	GREENWOOD WELL 3 LOYAL WELL 1 LOYAL WELL 4		12.3 3.74

TABLE 1. PUMPAGE FROM SAND-AND-GRAVEL AQUIFER IN 1979--CONTINUED

	OWNER ASSIGNED WELL IDENTIFICATION	TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	
CLARK	NEILLSVILLE WELL 1		28.4
	NEILLSVILLE WELL 2		21.8
	NEILLSVILLE WELL 3		9.47
	OWEN WELL 1		16.1
	OWEN WELL 2		5.29
	OWEN WELL 4		7.24
	THORP WELL 1		1.38
	THORP WELL 2		2.46
	THORP WELL 3		4.84
	THORP WELL 8		10.5
	WITHEE WELL 2		4.39
	WITHEE WELL 1		14.5
COLUMBIA	PORTAGE WELL 3		234
	POYNETTE WELL 2		45.9
CRAWFORD	PRAIRIE DU CHIEN WELL 2		449
DODGE	THERESA WELL 1		10.4
DOUGLAS	OLIVER WELL 1		2.43
EAU CLAIRE	AUGUSTA WELL 7		59.0
	EAU CLAIRE ALL WELLS		3,820
FLORENCE	FLORENCE WELL 1		53.9
	FLORENCE WELL 2		4.19
FOND DU LAC	RIPON WELL 9 (WP&L)		175
FOREST	CRANDON WELL 2		7.76
	CRANDON WELL 3		55.1
	LAONA WELL 1		39.8
	WABENO WELL 1		22.6
GRANT	CASSVILLE WELL 2		65.5
	JAMESTOWN WELL 1		3.44
IRON	MERCER WELL 1		.75
	MERCER WELL 2		17.8
	MONTREAL WELL 3		21.2
	MONTREAL WELL 4		13.8
	PENCE SOUTH WELL		2.54
	PENCE NORTH WELL		2.84
	IRON BELT WELL 1		6.93

TABLE 1. PUMPAGE FROM SAND-AND-GRAVEL AQUIFER IN 1979--CONTINUED

COUNTY	OWNER ASSIGNED WELL IDENTIFICATION	TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	ANNUAL PUMPAGE IN MILLIONS OF GALLONS
JACKSON	BLACK RIVER FALLS WELL 1		197
	BLACK RIVER FALLS WELL 2		.19
	BROCKWAY WELL 1		27.3
KENOSHA	PADDOCK LAKE WELL		17.3
	PLEASANT PRA WELL TIMBER		11.8
LA CROSSE	HOLMEN WELL 3		48.6
	HOLMEN WELL 4		61.4
	LA CROSSE WL 18H WARD AV		448
	LA CROSSE WL 16H SPENCE		13.4
	LA CROSSE WL 17H TRANE PI	K	380
	LA CROSSE WL 12L GRN BAY		47.0
	LA CROSSE WL 10H HOOD ST		146
	LA CROSSE WL 22H LOSEY		438
	LA CROSSE WL 20L MEM PK		691
	LA CROSSE WL 21L MEM PK		617
	LA CROSSE WL 13H PINE ST		372
	LA CROSSE WL 14H EMERSON	3	337
	LA CROSSE WL 15L MYRICK		497
	LA CROSSE WL 19H KING ST		498
	LA CROSSE WL 23H AIRPORT		120
	MEDARY SAN DIS 1 WELL 1		5.68
	ONALASKA WELL 5		11.7
	ONALASKA WELL 6		43.8
	ONALASKA WELL 7		268
	ONALASKA WELL 8		12.2
LANGLADE	ANTIGO WELL 9		96.2
	ANTIGO WELL 10		70.9
	ANTIGO WELL 12		44.4
	ANTIGO WELL 13		34.1
	ANTIGO WELL 17		124
	ANTIGO WELL 8		82.6
	ELCHO WELL 1		14.7
	WHITE LAKE WELL 1		10.5
LINCOLN	MERRILL WELL 3 WEST		10.5
	MERRILL WELL 1 EAST		36.2
	MERRILL WELL 4 EAST		144
	MERRILL WELL 2 WEST		2.49
	MERRILL WELL 5 EAST		252
	TOMAHAWK WELL 4		69.0
	TOMAHAWK WELL 5		91.7

TABLE 1. PUMPAGE FROM SAND-AND-GRAVEL AQUIFER IN 1979--CONTINUED

	WELL IDENTIFICATION	(FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLONS
MARATHON	ATHENS WELL 1		3.87
	ATHENS WELL 2		25.2
	BROKAW WELL 1A		35.7
	BROKAW WELL 4A		818
	BROKAW WELL 5		1,060
	EDGAR WELL 4 SHALLOW		13.5
	KRONENWETTER WELL 1		15.2
	KRONENWETTER WELL 2		14.6
	MARATHON HIGH LIFT PUMP		83.0
	MOSINEE WELLS 1A 3 4 5		126.
	ROTHSCHILD WELL 4		85.0
	ROTHSCHILD WELL 3		121
	SCHOFIELD WELL 2 SPRING		107
	SCHOFIELD WELL 3 GROSSMA	N	95.7
	SPENCER WELL 1		23.6
	SPENCER WELL 2		17.4
	STRATFORD WELL 4		.84
	STRATFORD WELL 5		5 <b>.92</b>
	STRATFORD WELL 6		9.72
	STRATFORD WELLS 2 AND 3		7.60
	WAUSAU WELL 3 (CTY #3)		<b>49</b> 5
	WAUSAU WELL 7 (CTY #7)		412
	WAUSAU WELL 6 (CTY #6)		5 <b>97</b>
	WAUSAU WELL 9 (TW #8)		274
	WESTON WELL 1 ALTE VERDE		71.9
	WESTON WELL 2 FOREMOST		<b>85.9</b>
	WESTON WELL 3 MESKER		114
MARINETTE	GOODMAN WELL 1		36.3
	NIAGARA WELL 3		81.8
	NIAGARA WELL 2		<b>90.</b> 5
	WAUSAUKEE WELL 1		25.0
MENOMINEE	MENOMINEE WELL-KESHENA		39.3
	MENOMINEE WELL-NEOPIT		70.4
OCONTO	GILLETT WELL 2		65.8
	GILLETT WELL 1		<b>39.</b> 5
	SURING WELL 1 DEEP		21.1
ONEIDA	MINOCQUA WELL 1		20.0
OIVELEDII			

TABLE 1. PUMPAGE FROM SAND-AND-GRAVEL AQUIFER IN 1979--CONTINUED

COUNTY	OWNER ASSIGNED	TABLE NUMBER OF CONTRIBUTING AQUIFER	ANNIIAI, PIIMPAGE IN
		(FOR MULTIAQUIFER WELLS)	
ONEIDA	RHINELANDER WELL 5		350
ONEIDA	RHINELANDER WELL 4		149
	RHINELANDER WELL 2		257
	THREE LAKES WELL 2		33.4
OUTAGAMIE	BLACK CREEK WELL 1		10.5
	BLACK CREEK WELL 2		84.4
	NICHOLS WELL 1		8.65
	SHIOCTON WELL 1		20.6
OZAUKEE	CEDARBURG WELL 2		12.1
	GRAFTON WELL 6		194
PEPIN	DURAND WELL 4		67.7
	PEPIN WELL 2		18.7
	PEPIN WELL 1		6.26
POLK	BALSAM LAKE WELL 3		20.8
	BALSAM LAKE WELL 2		6.53
	FREDERIC WELL 2		41.7
	FREDERIC WELL 3		20.4
	FREDERIC WELL 4		12.2
	FREDERIC WELL 5		36.6
	LUCK WELL 3		26.0
	LUCK WELL 2		22.4
	MILLTOWN WELL 1		32.2
PORTAGE	AMHERST WELL 1 ALTERNAT		10.2
	AMHERST WELL 2 MAIN WEI	,L	16.0
	STEVENS POINT WELL 6		598
	STEVENS POINT WELL 7		497
	STEVENS POINT WELL 8		356
	STEVENS POINT WELL 9		31.6
	STEVENS POINT WELL 5		14.8
	WHITING WELL 1		116
PRICE	PARK FALLS WELL 4		127
	PARK FALLS WELL 1		23.4
	PARK FALLS WELL 3		23.4
	PHILLIPS WELL 4		88.2
	PHILLIPS WELL 5		29.3
	PRENTICE WELL 1		8.17
	PRENTICE WELL 2		30.6
RACINE	WATERFORD WELL 1		28.9

TABLE 1. PUMPAGE FROM SAND-AND-GRAVEL AQUIFER IN 1979--CONTINUED

	WELL IDENTIFICATION	TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLONS
ROCK	BELOIT WELL 8 (WP&L)		674
NO OK	BELOIT WELL 10 (WP&L)		209
	BELOIT WELL 11 (WP&L)		917
	BELOIT WELL 12 (WP&L)		334
	JANESVILLE WELL 4		993
	JANESVILLE WELL 3		1,650
	JANESVILLE WELL 8		1,070
RUSK	BRUCE WELL 1		24.9
	BRUCE WELL 2		4.48
	HAWKINS WELL 1		16.9
	HAWKINS WELL 2		2.87
	LADYSMITH WELL 2		11.9
	LADYSMITH WELL 4	•	32.2
	LADYSMITH WELL 3		14.2
	LADYSMITH WELL 5		121
	WEYERHAEUSER WELL 1		7.99
ST. CROIX	SOMERSET WELL 3		18.0
SAUK	MERRIMAC WELL 1		10.7
	PRAIRIE DU SAC WELL 2		81.4
	PRAIRIE DU SAC WELL 1		16.1
	SAUK CITY WELL 3		129
	SAUK CITY WELL 2	3	16.7
SAWYER	RADISSON WELL 1		7.33
	WINTER WELL 3		14.9
SHAWANO	BIRNAMWOOD WELL 3		14.3
	BIRNAMWOOD WELL 4		5.09
	BOWLER WELL 1		10.6
	MATTOON WELL 1		3.90
	MATTOON WELL 2		9.19
	SHAWANO LAKE WELL 2		76.0
	TIGERTON WELL 1		1.15
	TIGERTON WELL 3		32.3
	WITTENBURG WELL 3		23.7
	WITTENBURG WELL 4		17.4
SHEBOYGAN	CASCADE WELL 1		11.7

TABLE 1. PUMPAGE FROM SAND-AND-GRAVEL AQUIFER IN 1979--CONTINUED

	OWNER ASSIGNED	TABLE NUMBER OF	ANNUAL PUMPAGE IN
COUNTY	WELL IDENTIFICATION	CONTRIBUTING AQUIFER	MILLIONS OF GALLONS
		(FOR MULTIAQUIFER WELLS)	
TAYLOR	GILMAN WELL 2		19.6
	MEDFORD WELL 1		18.4
	MEDFORD WELL 5		58.1
	MEDFORD WELL 8		56.8
	MEDFORD WELL 9		66.0
	RIB LAKE WELL 1		6.62
	RIB LAKE WELL 2		3.55
	RIB LAKE PUMP STATION		10.2
TREMPEALEAU	BLAIR WELL 5		57.3
	TREMPEALEAU WELL 2		25.7
VILAS	EAGLE RIVER WELL 2		50.5
,	EAGLE RIVER WELL 3		75.7
	PHELPS WELL 1		12.7
WALWORTH	DARIEN WELL 1		30.8
WILDWORLIN	DELAVAN WELL 2		57.8
	DELAVAN WELL 3		84.1
	DELAVAN WELL 4		122
	EAST TROY WELL 4		61.5
	EAST TROY WELL 3		119
	FONTANA WELL 2		87.3
	FONTANA WELL 1		56.5
	LAKE GENEVA WELL 2		32.4
	LAKE GENEVA WELL 3		118
	LAKE GENEVA WELL 4		353
	WALWORTH WELL 3		67.0
	WALWORTH WELL 4		51.2
	WILLIAMS BAY WELL 1		101
WASHBURN	MINONG WELL 1		74.8
	SPOONER WELL 3		122
	SPOONER WELL 4		0.71

TABLE 1. PUMPAGE FROM SAND-AND-GRAVEL AQUIFER IN 1979--CONTINUED

		TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLONS
	HARTFORD WELL 10		129
WASHINGTON	HARTFORD WELL 10		93.5
	HARTFORD WELL 12		78.2
	SLINGER WELL 4		76.7
	WEST BEND WELL 9		197
	WEST BEND WELL 6		128
	WEST BEND WELL 10		57.3
	WEST BEND WELL 7		110
	WEST BEND WELL 11		117
	WEST BEND WELL 12		137
	WEST BEND WELL 13		196
	WEST BEND WELL 8		124
WAUKESHA	HARTLAND WELL 1		9.10
	HARTLAND WELL 2		232
	HARTLAND WELL 3		120
	HARTLAND WELL 4		34.2
	MENOMONEE FALLS WELL 4		237
	MENOMONEE FALLS WELL 6		100
	OCONOMOWOC WELL 4		179
WAUPACA	CLINTONVILLE WELL 2		71.9
	CLINTONVILLE WELL 3		37.3
	CLINTONVILLE WELL 1		24.3
	CLINTONVILLE WELL 7		10.6
	CLINTONVILLE WELL 4		15.4
	CLINTONVILLE WELL 5		3.66
	CLINTONVILLE WELL 6		42.7
	EMBARRASS WELL 1		9.50
	EMBARRASS WELL 3		5.91
	IOLA WELL 1		30.0
	IOLA WELL 2		6.31
	MANAWA WELL 2		37.0
	MANAWA WELL 1		29.6
	MARION WELL 1		96.6
	NEW LONDON WELL 4 OSHKO	SH	117
	NEW LONDON WELL 2 WYMAN		42.8
	NEW LONDON WELL 5 DOUGL	AS	199
	NEW LONDON WELL 6		95.0
	NEW LONDON WELL 3 WEST		21.0
	NEW LONDON WELL 1 NORTH		23.5
	WAUPACA WELL 4		107

TABLE 1. PUMPAGE FROM SAND-AND-GRAVEL AQUIFER IN 1979--CONTINUED

	OWNER ASSIGNED WELL IDENTIFICATION	(FOR MULTIAQUIFER WELLS)	
WAUPACA	WAUPACA WELL 5		<b>519</b>
	WAUPACA WELL 3		54.5
	WAUPACA WELL 2		<b>97.</b> 5
	WEYAUWEGA WELL 3		67.3
	WEYAUWEGA WELL 1		65 <b>.9</b>
	WEYAUWEGA WELL 2		26.6
WAUSHARA	PLAINFIELD WELL 1 DEERE		39.8
	REDGRANITE WELL 1	4	19.7
WOOD	BIRON WELL 1		32.1
	MARSHFIELD WELLS 7 8 10		125
	MARSHFIELD WELLS 1-6		203
	MARSHFIELD WELL 13		47.3
	MARSHFIELD WELL 15		37.3
	MARSHFIELD WELL 16		64.3
	MARSHFIELD WELL 17		91.3
	MARSHFIELD WELL 18		101
	MARSHFIELD WELL 19		100
	MARSHFIELD WELL 20		114
	NEKOOSA WELL 4		14.5
	NEKOOSA WELL 3		6.77
	NEKOOSA WELL 5		116
	PITTSVILLE WELL 3		.87
	PITTSVILLE WELL 4		24.3
	PORT EDWARDS WELL 2		112
	WIS RAPIDS PUMP STATION		970
		TOTAL	37,286.

TABLE 2. PUMPAGE FROM SILURIAN AQUIFER IN 1979

	WELL IDENTIFICATION	(FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLON
BROWN	DENMARK WELL 2	3	2.80
	DENMARK WELL 3		44.7
CALUMET	BRILLON WELL 3		218
	BRILLION WELL 1 AND 2		77.8
	CHILTON WELL 2		29.4
	CHILTON WELL 6		11.1
	CHILTON WELL 8		31.2
	CHILTON WELL 5		8.94
	CHILTON WELL 4		28.3
	CHILTON WELL 7		164
	HILBERT WELL 1		30.5
	NEW HOLSTEIN WELL 3		48.1
	NEW HOLSTEIN WELL 2		36.2
	SHERWOOD WELL 1		19.0
DODGE	BROWNSVILLE WELL 1	3	4.33
	LOMIRA WELL 1	3	7.58
DOOR	SISTER BAY WELL 2		21.4
	STURGEON BAY WELL 1	3	1.54
	STURGEON BAY WL 3 3RD AV		284
	STURGEON BAY WL 5 LASNIN		41.6
	STURGEON BAY WL 6 QUINCY		67.0
	STURGEON BAY WL 7 MARTIN		89.2
	STURGEON BAY WL 8 DULUTH		177
FOND DU LAC	MOUNT CALVARY WELL 1		21.3
	ST CLOUD WELL 1		12.6
KENOSHA	PLEASANT PRA WELL ZIRBEL		10.6
	PLEASANT PRA WELL LADISH		75.7
KEWAUNEE	ALGOMA WELL 5		48.0
	ALGOMA WELL 1	3	9.23
	ALGOMA WELL 3		58.1
	KEWAUNEE WELL 2	3	16.9
	KEWAUNEE WELL 1		24.2
	LUXEMBURG WELL 1 AND 2		49.0

TABLE 2. PUMPAGE FROM SILURIAN AQUIFER IN 1979--CONTINUED

	WELL IDENTIFICATION	(FOD MILITIADILITED LIETTS)	MILLIONS OF GALLONS
MANITOWOC	CLEVELAND WELL 1		36.2
	KELLNERSVILLE WELL 1		10.6
	KIEL WELL 2		11.4
	KIEL WELL 1		18.5
	KIEL WELL 3		66.2
	MARIBEL WELL 1		8.60
	MISHICOT WELL 1		41.7
	REEDSVILLE WELL 2		22.7
	REEDSVILLE WELL 3		8.66
	ST NAZIANZ WELL 1		21.8
	VALDERS WELL 1	•	39.8
	WHITELAW WELL 1 DEEP		15.3
MILWAUKEE	FRANKLIN WELL 1	3	7.20
	FRANKLIN WELL 2		17.7
	FRANKLIN WELL 3	3	2.64
	FRANKLIN WELL 4		4.67
	FRANKLIN WELL 6		9.39
	FRANKLIN WELL 7		68.4
OZAUKEE	BELGIUM WELL 2		35.7
	BELGIUM WELL 1		37.9
	FREDONIA WELL 1		19.5
	FREDONIA WELL 2		30.9
	GRAFTON WELL 2		35.2
	GRAFTON WELL 5		119
	GRAFTON WELL 1		19.4
	LEMONT WELL LAC DU COU 1		.63
	LEMONT WELL LAC DU COU 3		43.3
	SAUKVILLE WELL 3		132
	SAUKVILLE WELL 2		26.8
	SAUKVILLE WELL 1		133
	VILLE DU PARC WELL 1		21.8
RACINE	CRESTVIEW SAN DIS WELL 2	2 3	15.3
SHEBOYGAN	ADELL WELL 1		14.7
	CEDAR GROVE WELL 2		31.5
	CEDAR GROVE WELL 1		52.8
	ELKHART LAKE WELL 1		19.8
	ELKHART LAKE WELL 2		46.7
	GLENBEULAH WELL 1 DEEP		15.2
	OOSTBURG WELL 2		27.3
	OOSTBURG WELL 1		27.5

TABLE 2. PUMPAGE FROM SILURIAN AQUIFER IN 1979--CONTINUED

	OWNER ASSIGNED WELL IDENTIFICATION	TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	ANNUAL PUMPAGE IN MILLIONS OF GALLONS
SHEROVCAN	PLYMOUTH WELL 14		103
OHEBO TOM	PLYMOUTH WELL 11		48.3
	PLYMOUTH WELL 12		237
	PLYMOUTH WELL 13		108
	RANDOM LAKE WELL 1		18.0
	RANDOM LAKE WELL 2		121
	WALDO WELL 1		27.9
WASHINGTON	GERMANTOWN WELL 2		63.6
	HARTFORD WELL 9	3	13.5
	JACKSON WELL 2	3	6.42
	JACKSON WELL 1		50.9
	KEWASKUM WELL 2		79.0
	KEWASKUM WELL 1		78.5
	SLINGER WELL 3		22.3
	WEST BEND WELL 4		323
	WEST BEND WELL 5A		28.9
WAUKESHA	BROOKFIELD WELL 7		.30
	BROOKFIELD WELL 6		15.3
	BROOKFIELD WELL 10		16.8
	BROOKFIELD WELL 4		74.8
	BROOKFIELD WELL 5		1.32
	BROOKFIELD WELL 11		45.4
	BROOKFIELD WELL 9		13.4
	BROOKFIELD WELL 15		17.5
	BROOKFIELD WELL 1		10.4
	BROOKFIELD WELL 14		2.99
	BROOKFIELD WELL 18		38.3
	BROOKFIELD WELL 2		70.7
	BROOKFIELD WELL 3		1.65
	BROOKFIELD WELL 22		.31
	BROOKFIELD WELL 13		18.7
	BROOKFIELD WELL 24		5.54
	BROOKFIELD WELL 12		3.73
	BROOKFIELD WELL 20		42.5
	NEW BERLIN REGAL MANOR		21.9
	WESTBROOKE S D 1 WELL 1		13.6
	WESTBROOKE S D 1 WELL 2		7.27
		TOTAL	4,840.

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979

	WELL IDENTIFICATION	(FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLONS
ADAMS	ADAMS WELL 1 ADAMS WELL 2		53.2 50.1
	ADAMS WELL 2		30.1
BARRON	ALMENA WELL 1		17.8
	BARRON WELL 3		290
	BARRON WELL 1		50.5
	BARRON WELL 2		21.0
	CAMERON WELL 1		41.5
	CAMERON WELL 2		32.4
	CUMBERLAND WELL 5		43.6
	CUMBERLAND WELL 4		133
	CUMBERLAND WELL 1		3.14
	CUMBERLAND WELL 3		35.8
	DALLAS WELL 1		12.3
	HAUGEN WELL 1		6.05
	RICE LAKE WELL 3 ALLEN		53.6
	RICE LAKE WELL 2 MAIN ST		24.6
	RICE LAKE WELL 1 WATER S	T	355
	RICE LAKE WELL 4 NARROWS		87.5
	TURTLE LAKE WELL 1		15.2
	TURTLE LAKE WELL 2		16.1
BROWN	ALLOUEZ WELL 2		71.4
	ALLOUEZ WELL 1		65.7
	ALLOUEZ WELL 3		7.84
	ALLOUEZ WELL 4		70.9
	ALLOUEZ WELL 5		154
	ALLOUEZ WELL 6		186
	ASHWAUBENON WELL 2		140
	ASHWAUBENON WELL 3		244
	ASHWAUBENON WELL 4		138
	ASHWAUBENON WELL 5		118
	ASHWAUBENON WELL 1		131
	BELLEVUE WELL 1		46.3
	BELLEVUE WELL 2	•	145 11.2
	DENMARK WELL 2 DE PERE WELL 1	2	44.4
	DE PERE WELL 1		36.2
	DE PERE WELL 2 DE PERE WELL 4		195
	DE PERE WELL 4 DE PERE WELL 5		68.1
	DE PERE WELL 3		196
	HOWARD WELL 1		8.47
	HOWARD WELL 2		191
	WRIGHTSTOWN WELL 1		.44
	WRIGHTSTOWN WELL 2		28.4

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

	WELL IDENTIFICATION	TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLONS
RIIFFATO	ALMA WELL 1		50.9
DOFFALO	COCHRANE WELL 1		21.2
	FOUNTAIN CITY WELL 1		5.91
	MONDOVI WELL 2 AND 3		91.8
CALUMET	NEW HOLSTEIN WELL 1		82.8
CHIPPEWA	BLOOMER WELL 4		45.3
	BLOOMER WELL 5		58.0
	BLOOMER WELL 3		49.2
	BLOOMER WELL 2		41.2
	BOYD WELL 1		8.86
	BOYD WELL 3		7.97
	NEW AUBURN WELL 1		14.3
CLARK	ABBOTSFORD WELL 4		11.7
	ABBOTSFORD WELL 6		7.53
	ABBOTSFORD WELL 8		6.58
	LOYAL WELL 6		5.48
	LOYAL WELL 7		2.75
	OWEN WELL 5		2.06
	OWEN WELL 3		6.12
	THORP WELL 4		10.5
	THORP WELL 5		5.44
	THORP WELL 9		9.40
	THORP WELL 10		10.6
COLUMBIA	ARLINGTON WELL 2		15.9
	CAMBRIA WELL 3		23.9
	CAMBRIA WELL 1		26.6
	COLUMBUS WELL 2		159
	COLUMBUS WELL 1		2.69
	FALL RIVER WELL 1		29.1
	FALL RIVER WELL 2		28.8
	FRIESLAND WELL 1		6.45
	HARMONY GROVE SANITARY		21.2
	LODI WELL 3		80.4
	LODI WELL 2		42.3
	PARDEEVILLE WELL 1		35.1
	PARDEEVILLE WELL 2		19.5
	PORTAGE WELL 1		72.1
	PORTAGE WELL 2		131
	POYNETTE WELL 1		6.09

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

	WELL IDENTIFICATION	(FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLONS
COLUMBIA	RANDOLPH WELL 1 AND 2 RIO WELL 3 RIO WELL 2		48.9 14.8 15.2
	WISCONSIN DELLS WELL 3 WISCONSIN DELLS WELL 4 WISCONSIN DELLS WELL 1 WYOCENA WELL 1		18.7 19.8 132 17.5
CRAWFORD	EASTMAN WELL 1 GAYS MILLS WELL 1 MOUNT STERLING WELL 1 SENECA SAN DIST 1 WELL SOLDIERS GROVE WELL 1 WAUZEKA WELL 2	1	7.79 30.0 4.81 5.98 28.8 20.2
DANE	MIDDLETON APLWD HIL WL MIDDLETON APLWD HIL WL BELLEVILLE WELL 1 BELLEVILLE WELL 2 BLACK EARTH WELL 2 BLACK EARTH WELL 1 BLOOMING GROVE SD WELL CAMBRIDGE WELL 2 COTTAGE GROVE WELL 1 COTTAGE GROVE WELL 1 CROSS PLAINS WELL 1 CROSS PLAINS WELL 1 DANE WELL 1 DANE WELL 2 DANE WELL 1 DEERFIELD WELL 1 DEERFIELD WELL 1 DEERFIELD WELL 2 DE FOREST WELL 1 DE FOREST WELL 3 FITCHBURG WELL 2 FITCHBURG WELL 3 FITCHBURG WELL 5 MADISON UNIT WELL 10 MADISON UNIT WELL 18 MADISON UNIT WELL 12	2	4.77 .21 42.0 27.8 14.7 18.1 21.9 32.0 10.6 17.8 38.0 28.5 2.20 15.5 30.8 25.9 74.0 60.3 77.4 246 16.2 13.2 53.5 256 659 30.2 .80
	MADISON UNIT WELL 1 MADISON UNIT WELL 16 MADISON UNIT WELL 2 MADISON UNIT WELL 22 MADISON UNIT WELL 20 MADISON UNIT WELL 15		1,060 896 29.4 312 1,280

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

COUNTY	WELL IDENTIFICATION	(FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLONS
DANE	MADISON UNIT WELL 13		781
	MADISON UNIT WELL 7		382
	MADISON UNIT WELL 5		261
	MADISON UNIT WELL 4		36.5
	MADISON UNIT WELL 9		258
	MADISON UNIT WELL 6		439
	MADISON UNIT WELL 17		614
	MADISON UNIT WELL 14		884
	MADISON EAST WELL		286
	MADISON NICHOLS STA WELI	<u>.</u>	496
	MADISON UNIT WELL 23		259
	MADISON UNIT WELL 19		437
	MADISON UNIT WELL 8		349
	MADISON UNIT WELL 3		62.2
	MADISON UNIT WELL 11		464
	MARSHALL WELL 2		63.0
	MAZOMANIE WELL 3		46.6
	MC FARLAND WELL 1	~	60.2
	MC FARLAND WELL 3		54 <b>.0</b>
	MC FARLAND WELL 2		30.1
	MIDDLETON WELL 2 AND 3		122
	MIDDLETON WELL 5		214
	MIDDLETON WELL 4		254
	MONONA WELL 3		171
	MONONA WELL 2		85.0
	MONONA WELL 1		79.9
	MORRISONVILLE WELL 1		9.91
	MOUNT HOREB WELL 3		108
	MOUNT HOREB WELL 5		101
	OREGON WELL 2		45.6
	OREGON WELL 3		89.0
	STOUGHTON WELL 5		340
	STOUGHTON WELL 3		121
	STOUGHTON WELL 4		38.9
	SUN PRAIRIE WELL 5		221
	SUN PRAIRIE WELL 2		51.3
	SUN PRAIRIE WELL 6		3.24
	SUN PRAIRIE WELL 3		104
	SUN PRAIRIE WELL 4		339
	VERONA WELL 2		30.1
	VERONA WELL 1		22.2 109
	VERONA WELL 3		
	WAUNAKEE WELL 2		100
	WAUNAKEE WELL 1		120
	WINDSOR WELL 1		23.6
	WINDSOR WELL 2		23.4

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

	WRIT IDENTIFICATION	(FOR MULTIAOUTEER WELLS)	MILLIONS OF GALLONS
DODGE	BEAVER DAM WELL 1&2&3		732
	BROWNSVILLE WELL 1	2	17.3
	BROWNSVILLE WELL 2		.24
	CLYMAN WELL 2 SOUTH	4	20.6
	CLYMAN WELL 4 WEST	4	21.8
	CLYMAN WELL 3 NORTH	4	6.78
	FOX LAKE WELL 1		53.8
	HORICON WELL 1 MILL ST		42.9
	HORICON WELL 3 BARSTON		18.0
	HORICON WELL 3 CLINTON		156
	HUSTISFORD WELL 2		25.2
	HUSTISFORD WELL 1		11.5
	IRON RIDGE WELL 2		11.7
	IRON RIDGE WELL 1		6.04
	JUNEAU WELL 2	4	23.9
	JUNEAU WELL 3		80.1
	LEROY SANITARY DISTRICT		8.62
	LOMIRA WELL 1	2	30.3
	LOMIRA WELL 2		6.24
	LOWELL WELL 1		7.08
	MAYVILLE WELL 5		93.1 68.1
	MAYVILLE WELL 2 MAYVILLE WELL 1		44.9
	MAYVILLE WELL 1		51.2
	MAYVILLE WELL 3		17.1
	REESEVILLE WELL 2		8.73
	REESEVILLE WELL 2		9.61
	THERESA WELL 2		10.0
	WAUPUN WELL 2		12.2
	WAUPUN WELL 3		82.3
	WAUPUN WELL 1		258
DOOR	STURGEON BAY WELL 1	2	6.14
DUNN	BOYCEVILLE WELL 1		27.2
	BOYCEVILLE WELL 2		2.81
	COLFAX WELL 1		1 <b>9.</b> 5
	COLFAX WELL 2		21.2
	ELK MOUND WELL 1		20.3
	KNAPP WELL 1		15.6
	MENOMONIE WELL 3		322
	MENOMONIE WELL 4		121
	MENOMONIE WELL 5		53.0
	WHEELER WELL 1		9.34

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

	WELL IDENTIFICATION	/ A	MILLIONS OF GALLON
EAU CLAIRE	ALTOONA WELL 5		14.2
	ALTOONA WELL 1		5.63
	ALTOONA WELL 4		17.7
	ALTOONA WELL 3		108
	AUGUSTA WELL 6		59.9
	AUGUSTA WELL 5		27.6
	AUGUSTA WELL 4		14.0
	FAIRCHILD WELL 1		13.2
	FALL CREEK WELL 2		16.4
	FALL CREEK WELL 1		15.1
	WASH HGTS WELL 3		62.3
	WASH HGTS WELL 1		24.7
	WASH HGTS WELL 2		22.5
FOND DU LAC	BRANDON WELL 1		27.8
	CAMPBELLSPORT WELL 2		51.3
	CAMPBELLSPORT WELL 1		43.8
	FAIRWATER WELL 1		8.36
	FOND DU LAC WELL 17		182
	FOND DU LAC WELL 20		185
	FOND DU LAC WELL 18		168
	FOND DU LAC WELL 19		118
	FOND DU LAC WELL 16		102
	FOND DU LAC WELL 11		181
	FOND DU LAC WELL 12		237
	FOND DU LAC WELL 10		49.8
	FOND DU LAC WEST REES		727
	FOND DU LAC MCDERMOTT		88.6
	FOND DU LAC MORRIS SUB		422
	FOND DU LAC WELL 14	4	87.3
	FOND DU LAC WELL 15		145
	FOND DU LAC WELL 21		119
	FOND DU LAC WELL 13		142
	MARY HILL PARK SD WELL		2.24
	NORTH FONDDULAC WELL 2&3	3	118
	OAKFIELD WELL 2		36.0
	OAKFIELD WELL 1 RIPON WELL 5 (WP&L)		34.1
	RIPON WELL 5 (WP&L)		47.1
	RIPON WELL 6 (WP&L)		128 51.2
GRANT	BAGLEY WELL 1		10.5
OMM	BLOOMINGTON WELL 1		29.1
	BLUE RIVER WELL 1		12.1
	BOSCOBEL WELL 3		111
			TTT

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

COUNTY	WELL IDENTIFICATION	TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLONS
		(FOR HOLITAQUIPER WELLS)	
GRANT	CUBA CITY POWER HOUSE		6.35
Oldii.1	DICKEYVILLE WELL 2		16.0
	DICKEYVILLE WELL 1		10.7
	FENNIMORE WELL 2		93.7
	HAZEL GREEN WELL 2		42.4
	KIELER WELL 1		13.8
	LANCASTER WELL 2		223
	LIVINGSTON WELL 1		23.6
	MONTFORT WELL 1		6.00
	MONTFORT WELL 2		14.4
	MOUNT HOPE WELL 1		7.94
	MUSCODA WELL 1		89.1
	PATCH GROVE WELL 1		8.37
	PLATTEVILLE WELL 2		278
	PLATTEVILLE WELL 4		68.2
	POTOSI WELL 1		2.77
	POTOSI WELL 2		30.2
	STITZER WELL 1		7.72
	TENNYSON WELL 1		15.4
GREEN	ALBANY WELL 2		15.5
	ALBANY WELL 1		22.6
	BRODHEAD WELL 5		52.6
	BRODHEAD WELL 2		63.5
	BROOKLYN WELL 1		20.2
	BROWNTOWN WELL 1		5.58
	MONROE WELL 4		60.0
	MONROE WELL 7		263
	MONROE WELL 6		298
	MONROE WELL 1		31.0
	MONROE WELL 5		215
	MONTICELLO WELL 2		49.4
	NEW GLARUS WELL 2		93.3
GREEN LAKE	BERLIN WELL 4 CUMBERLA	ND	160
	BERLIN WELL 5 KOSSWITH		169
	BERLIN WELL 3 SPRING		41.2
	DALTON WELL 1		2.32
	GREEN LAKE WELL 1		26.6
	GREEN LAKE WELL 2		24.3
	MARKESAN WELL 2		28.0
	MARKESAN WELL 3		32.2
	PRINCETON WELL 1		32.5
	PRINCETON WELL 2		32.3

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

	WELL IDENTIFICATION	TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLONS
LOWA	ARENA VILLAGE WELL 1		14.9
	AVOCA VILLAGE WELL 1		13.9
	BARNEVELD WELL 1		4.99
	BARNEVELD WELL 2		38.3
	COBB WELL 2		19.5
	DODGEVILLE WELL 6		55.4
	DODGEVILLE WELL 5		56.7
	DODGEVILLE WELL 1		1.85
	DODGEVILLE WELL 7		81.6
	HIGHLAND WELL 2		9.31
	HIGHLAND WELL 3		12.4
	HOLLANDALE WELL 1		7.80
	LINDEN WELL 1		24.1
	MINERAL POINT WELL 3		154
	REWEY WELL 1		13.4
	RIDGEWAY WELL 1		16.7
JACKSON	ALMA CENTER WELL 1		15.9
	HIXTON WELL 1		13.6
	MELROSE WELL 1		12.8
	MERRILLAN WELL 3		7.94
	MERRILLAN WELL 4		8.46
JEFFERSON	FORT ATKINSON WELL 4		480
	FORT ATKINSON WELL 6		134
	FORT ATKINSON WELL 7		146
	JEFFERSON WELL 2		91.4
	JEFFERSON WELL 3		97.7
	JEFFERSON WELL 4		232
	JOHNSON CREEK WELL 2		29.0
	JOHNSON CREEK WELL 3		27.6
	LAKE MILLS WELL 4		328
	PALMYRA WELL 1		21.6
	PALMYRA WELL 2		29.1
	WATERLOO WELL 1		13.8
	WATERLOO WELL 3		77.8
	WATERLOO WELL 2		66.0
	WATERTOWN WELL 4		81.7
	WATERTOWN WELL 3		11.4
	WATERTOWN WELL 5		551
	WATERTOWN WELL 5 WATERTOWN WELL 6		444

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

	WELL IDENTIFICATION	(DAD MITTEL ANTENDE CONTRACT	MILLIONS OF GALLONS	
	CAMP DOUGLAS WELL 1		16.5	
	ELROY WELL 2		76.2	
	LYNDON STATION WELL 1		10.3	
	MAUSTON CITY WELL 1		186	
	NECEDAH WELL 2		19.1	
	NECEDAH WELL 1		34.0	
	NEW LISBON WELL 3		48.9	
	NEW LISBON WELL 2		.95	
	UNION CENTER WELL 1		6.12	
	WONEWOC WELL 2		42.9	
KENOSHA	BRISTOL WELL 1		32.5	
	CAROL BEACH WELL 1		11.7	
KEWAUNEE	ALGOMA WELL 1	2	36.9	
	KEWAUNEE WELL 2	2	67.5	
LA CROSSE	BANGOR WELL 2 SUBSTATION	1	1.44	
	BANGOR WELL 1 FIRE STA		68.8	
	LA CROSSE WELL 11H		22.8	
	LA CROSSE WL 14H EMERSON	1	33.7	
	MINDORO WELL 1		8.36	
	ROCKLAND WELL 1		9.14	
	ST JOSEPH WELL 4		11.9	
	ST JOSEPH WELL 3		2.16	
	SHELBY DIST 2 WL SKYLINE		8.96	
	SHELBY DIST 2 WL ARB HLS	<b>;</b>	7.53	
	SHELBY DIST 2 WL WDGWD 1		11.0	
	WEST SALEM WELL 2		46.5	
	WEST SALEM WELL 3		71.4	
LAFAYETTE	ARGYLE WELL 3		38.0	
	BELMONT WELL 3		40.5	
	BELMONT WELL 2		6.87	
	BENTON WELL 1		23.6	
	BLANCHARDVILLE WELL 1		60.2	
	DARLINGTON WELL 3		18.9	
	DARLINGTON WELL 2		137	
	GRATIOT WELL 1		16.9	
	SHULLSBERG WELL 3		47.4	
	SHULLSBERG WELL 4		28.4	
	SOUTH WAYNE WELL 1		28.1	
	WIOTA SAN DIST 1 WELL 1		7 <b>.9</b> 5	

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

		·		
	OWNER ASSIGNED WELL IDENTIFICATION	(FOR MULTIAQUIFER WELLS)	ANNUAL PUMPAGE IN MILLIONS OF GALLONS	
			5 (0	
MARINETTE			5.62 54.1	
	COLEMAN WELL 2 PESHTIGO WELL 2		143	
	PESHTIGO WELL 2 PESHTIGO WELL 1 AND 3		11.7	
	POUND WELL 1 AND 3		11.9	
MARQUETTE	MONTELLO WELL 1		21.2	
	MONTELLO WELL 2	4	22.9	
MILWAUKEE	FRANKLIN WELL 1	2	28.8	
	FRANKLIN WELL 3	2	10.6	
	FRANKLIN WELL 5		35.1	
MONROE	CASHTON WELL 5 BRADY		6.48	
	CASHTON WELL 4 CREMERY		35.0	
	KENDALL WELL 2		9.92	
	KENDALL WELL 3		3.06	
	NORWALK WELL 1		38.7	
	SPARTA WELL 5		15.4	
	SPARTA WELL 6		150	
	SPARTA WELL 7		175	
	SPARTA WELL-SERVICE BLDG	}	332	
	SPARTA WELL 1 ROLLING HI		0.76	
	SPARTA WELL 2 ROLLING HI		16.1	
	TOMAH WELL SOUTH		99.2	
	TOMAH WELL NEW EAST		94.1	
	TOMAH WELL WEST		69.7	
	WARRENS WELL 1		5.34	
	WILTON WELL 2		26.1	
OCONTO	LENA WELL 1		29.4	
	LENA WELL 2		71.3	
	OCONTO WELL 7		113	
	OCONTO WELL 5		73.7	
	OCONTO WELL 6		30.7	
	OCONTO FALLS WELL 2		60.7	
	OCONTO FALLS WELL 3		58.8	

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

COUNTY	WELL IDENTIFICATION	TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLONS
OUTAGAMIE	HORTONVILLE WELL 1		67.3
	KAUKAUNA WELL 4		240
	KAUKAUNA WELL 9		70.6
	KAUKAUNA WELL 5		86.4
	KAUKAUNA WELL 8		116
	KIMBERLY WELL LINCOLN		159
	KIMBERLY WELL N JOHNSON		214
	LITTLE CHUTE WELL 4		153
	LITTLE CHUTE WELL 3		73.1
	SEYMOUR WELL 2		18.9
	SEYMOUR WELL 1		241
OZAUKEE	CEDARBURG WELL 5		132
	CEDARBURG WELL 3		160
	CEDARBURG WELL 1		88.7
	CEDARBURG WELL 4		107
	GRAFTON WELL 3		82.2
	GRAFTON WELL 4		75.0
	LEMONT WELL WHITMAN PLAC		7.69
PEPIN	DURAND WELL 3 PROSPECT		28.2
PIERCE	ELLSWORTH WELL 1		37.0
	ELLSWORTH WELL 2		43.7
	ELMWOOD WELL 1		32.4
	PRESCOTT WELL 3		104
	PRESCOTT WELL 2		14.0
	RIVER FALLS WELL 4		195
	RIVER FALLS WELL 2 OAK RIVER FALLS WELL 3 CEDAR		49.2
	ST CROIX IMPROV WELL 1		78.4 4.17
	SPRING VALLEY WELL 3		53.8
POLK	AMERY WELL 2		39.1
TOLK	AMERY WELL 3		60.7
	CENTURIA WELL 3		26.5
	CLAYTON WELL 2		16.8
	CLAYTON WELL 1		17.3
	CLEAR LAKE WELL 2 VILLAG	E	90.0
	CLEAR LAKE WELL 4 CREAME		47.6
	DRESSER WELL 3		39.5
	DRESSER WELL 2 CREAMERY		44.2
	OSCEOLA WELL 1		4.56
	OSCEOLA WELL 2		77.8
	ST CROIX FALLS WELL 8		24.5
	ST CROIX FALLS WELL 3		15.1
	ST CROIX FALLS WELL 9		19.9
	ST CROIX FALLS WELL 7		28.8

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

	WELL IDENTIFICATION		MILLIONS OF GALLONS
RACINE	BURLINGTON WELL 9		163
	BURLINGTON WELL 8		126
	BURLINGTON WELL 6		58.6
	BURLINGTON WELL 7		160
	CADDY VISTA WELL 1		24.0
	CRESTVIEW SAN DIS WELL		26.9
	CRESTVIEW SAN DIS WELL 2	2 2	61.3
	NORTH CAPE SD WELL 1		5.38
	UNION GROVE WELL 2		37.8
	UNION GROVE WELL 3-1		12.4
	UNION GROVE WELL 3-2		128
	UNION GROVE WELL 5		135
	WATERFORD WELL 2		50.5
RICHLAND	CAZENOVIA WELL 1		9.76
	LONE ROCK WELL 1		22.2
	RICHLAND CTR WELL 3		9.33
	RICHLAND CTR WELL 4		216
	SEXTONVILLE WELL 1		9.66
	VIOLA WELL 3		<b>30.</b> 5
	YUBA WELL 1		3.73
ROCK	BELOIT WELL 3 (WP&L)		164
	BELOIT WELL 4 (WP&L)		202
	BELOIT WELL 5 (WP&L)		193
	BELOIT WELL 9 (WP&L)		214
	CLINTON WELL 2		2.54
	CLINTON WELL 3		55.3
	EDGERTON WELL 1		60.8
	EDGERTON WELL 2		54.1
	EDGERTON WELL 4		120
	EDGERTON WELL 3		15 <b>0</b>
	EVANSVILLE WELL 2		127
	FOOTVILLE WELL 2		14.3
	FOOTVILLE WELL 1		15.1
	MILTON WELL 1		5.07
	MILTON WELL 2		9.03
	MILTON WELL 3		151
	MILTON WELL 4		.20
	ORFORDVILLE WELL 1		2,64
	ORFORDVILLE WELL 2		45.4

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

	OWNER ASSIGNED WELL IDENTIFICATION	CONTRIBUTING AQUIFER	MILLIONS OF GALLONS
		,	
ST. CROIX			84.9
	GLENWOOD CITY WELLS 1&2 HAMMOND WELL 1		33.2 26.0
	HAMMOND WELL 2		8.92
	HUDSON WELL 4		109
	HUDSON WELL 3		102
	HUDSON WELL 5		82.5
	NEW RICHMOND WELL 4		176
	NEW RICHMOND WELL 4 NEW RICHMOND WELL 2		55.1
	NEW RICHMOND WELL 3		50.1
	ROBERTS WELL 2		10.4
	ROBERTS WELL 2		14.6
	SOMERSET WELL 1		18.3
	STAR PRAIRIE WELL 1		13.7
	WOODVILLE WELL 2		21.5
			101
SAUK	BARABOO WELL 2		101
	BARABOO WELL 6		144
	BARABOO WELL 4		147
	LAVALLE WELL 1		12.1 4.74
	LOGANVILLE WELL 1		21.3
	NORTH FREEDOM WELL 2		8.96
	PLAIN WELL 1 PLAIN WELL 2		23.4
	REEDSBURG LUCKY ST WELL		223
	REEDSBURG EAST WELL		46.8
	REEDSBURG WEST WELL		31.0
	REEDSBURG RR ST WELL		125
	REEDSBURG MYRTLE ST WELL		2.68
	ROCK SPRINGS WELL 1	4	11.5
	SAUK CITY WELL 2	1	1.67
	SPRING GREEN WELL 2	1	58.9
SAWYER	HAYWARD WELL 1		37.8
SAWIER	HAYWARD WELL 3		46.6
	HAYWARD WELL 4		9.15
SHAWANO	BONDUEL WELL 1		4.27
DILAMANO	BONDUEL WELL 1		97.4
	SHAWANO WELL 5		275
	SHAWANO WELL 5 SHAWANO WELL 7		105
	SHAWANO WELL / SHAWANO WELL 8		97.7

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

	WELL IDENTIFICATION	TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLONS
TREMPEALEAU	ARCADIA WELL 3		98.3
TREIT EMEENT	ARCADIA WELL 2		78.4
	ELEVA WELL 1		16.1
	ETTRICK WELL 1		21.8
	GALESVILLE WELL 2		103
	INDEPENDENCE WELL 1		36.5
	OSSEO WELL 3		39.1
	OSSEO WELL 2		13.2
	PIGEON FALLS WELL 1		8.30
	STRUM WELL 1&2&3		23.2
	WHITEHALL WELL 1		40.5
	WHITEHALL WELL 2		43.0
VERNON	CHASEBURG WELL 1		13.7
	COON VALLEY WELL 1&2		27.5
	GENOA WELL 1		10.7
	HILLSBORO WELL 3		63.6
	LAFARGE WELL 2		29.4
	ONTARIO WELL 1		11.5
	READSTOWN WELL 1		19.1
	STODDARD WELL 2		20.3
	STODDARD WELL 1		2.61
	VIROQUA WELL 3		12.5
	VIROQUA WELL 4		115
	VIROQUA WELL 2		48.7
	WESTBY WELL 6		48.8
	WESTBY WELL 5		54.5
WALWORTH	EAST TROY WELL 5		66.3
	ELKHORN WELL 5		28.4
	ELKHORN WELL 4		97.1
	ELKHORN WELL 6		98.3
	GENOA CITY WELL 1		39.2
	SHARON WELLS 1&2		45.7
	TROY CENTER WELL 1		3.15
	WHITEWATER WELL 6		241
	WHITEWATER WELL 5		203
WASHBURN	BIRCHWOOD WELL 1		14.8
	SHELL LAKE WELL 2		52.9

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

COUNTY	OWNER ASSIGNED WELL IDENTIFICATION	TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLONS	
WASHINGTON			48.9	
	GERMANTOWN WELL 1		9.59	
	GERMANTOWN WELL 3		74.5	
	GERMANTOWN WELL 4		26.6	
	HARTFORD WELL 9	2	53.9	
	HARTFORD WELL 6		61.8	
	HARTFORD WELL 4		41.7	
	JACKSON WELL 2	2	25.7	
WAUKESHA	BROOKFIELD WELL 16		1.17	
	BROOKFIELD WELL 17		34.3	
	BROOKFIELD WELL 8		48.1	
	BROOKFIELD WELL 21		52.0	
	BROOKFIELD WELL 19		1.38	
	BUTLER WELL 1		175	
	DOUSMAN WELL 1		33.5	
	EAGLE WELL 1		25.6	
	MENOMONEE FALLS WELL 2		177	
	MENOMONEE FALLS 3		210	
	MENOMONEE FALLS WELL 5 MUKWONAGO WELL 2		193 7.41	
	MUKWONAGO WELL 2 MUKWONAGO WELL 3		137	
	NEW BERLIN WELL FORESTV	7 T T T T T T T T T T T T T T T T T T T	23.1	
	NEW BERLIN WELL GLEND F		41.6	
	NEW BERLIN WELL GRN RIL		58.4	
	NEW BERLIN WELL 2	,02	153	
	NEW BERLIN WELL ROGER I	OR .	223	
	NEW BERLIN RGL MR STD-E		63.0	
	OCONOMOWOC WELLS 1,2&3		326	
	PEWAUKEE WELL 3 VILLAGE	:	87.8	
	PEWAUKEE WELL 4 VILLAGE	1	15.4	
	PEWAUKEE WELL 2 VILLAGE	1	120	
	SUSSEX WELL 1 ESTATES		40.7	
	SUSSEX WELL 2 HEIGHTS		38.9	
	SUSSEX WELL 3 SPRING GR		24.4	
	WAUKESHA WELL 3 MORELAN		293	
	WAUKESHA WELL 4 NEWHALI		130	
	WAUKESHA WELL 5 EAST		394	
	WAUKESHA WELL 6 SUNSET		690	
	WAUKESHA WELL 7 MERRILI		616	
	WAUKESHA WELL 8 SAYLEVI		575 250	
	WAUKESHA WELL 9 CRESTWO	UUU	250 225	
	WAUKESHA WELL 2 BAXTER			
	WAUKESHA WELL 1 NORTH		353	

TABLE 3. PUMPAGE FROM SANDSTONE AQUIFER IN 1979--CONTINUED

COUNTY	OWNER ASSIGNED WELL IDENTIFICATION	TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	
WAUSHARA	COLOMA WELL 1 HANCOCK WELL 1		21.8 18.6
WINNEBAGO	MENASHA SAN DIS 4 WELL MENASHA SAN DIS 4 WELL MENASHA SAN DIS 4 WELL OMRO WELL 1 OMRO WELL 2 WINNECONNE WELL 2	5	160 244 167 22.5 57.8 70.6
		TOTAL	53,356.

TABLE 4. PUMPAGE FROM PRECAMBRIAN AQUIFER IN 1979

COUNTY	WELL IDENTIFICATION	TABLE NUMBER OF CONTRIBUTING AQUIFER (FOR MULTIAQUIFER WELLS)	MILLIONS OF GALLONS	
BARRON			30.9	
	CHETEK WELL 2		85.4	
BAYFIELD	IRON RIVER WELL 3		25.3	
	WASHBURN WELL 1		81.1	
	BAYFIELD WELL 1		43.1	
	BAYFIELD WELL 2		13.4	
CLARK	COLBY WELL GRANITE	1	•57	
	GREENWOOD WELL 4		4.86	
	GREENWOOD WELL 5		6.00	
	GREENWOOD WELL 7		9.03	
	THORP WELL 11		12.6	
DODGE	CLYMAN WELL 2 SOUTH	3	4.12	
	CLYMAN WELL 4 WEST	3	4.37	
	CLYMAN WELL 3 NORTH	3	1.36	
	JUNEAU WELL 2	3	4.78	
FOND DU LAC	FOND DU LAC WELL 14	3	17.5	
MARATHON	EDGAR WELL 6 DEEP		10.8	
	EDGAR WELL 7 DEEP		53.8	
	STRATFORD WELL 7		9.44	
MARQUETTE	MONTELLO WELL 2	3	4.58	
PORTAGE	JUNCTION CITY WELL 3		10.1	
TORINOD	JUNCTION CITY WELL 1		1.15	
SHAWANO	GRESHAM WELL 2		15.8	
WALWORTH	WHITEWATER WELLS 7&8		107	
WAUSHARA	REDGRANITE WELL 1	1	1.97	
WOOD	VESPER WELL 1		32.0	
		TOTAL	591.	

TABLE 5. SUMMARY OF 1979 PUMPAGE FROM AQUIFERS IN WISCONSIN

COUNTY	C V VID	AND CDAVET	CTTIIDTAN	CANDSTONE	DDFCAMRDTAN	ANNUAL PUMPAGE IN MILLIONS OF GALLONS
		AND GRAVEL				
ADAMS		0	0	103	0	103
ASHLAND		111	0	0	0	111
BARRON		0	Ö	1,240	116	1,360
BAYFIELD		0	0	0	163	163
BROWN		0	48	2,300	0	2,350
BUFFALO		11	0	170	0	181
BURNETT		107	0	0	Ō	107
CALUMET		0	703	83	0	786
CHIPPEWA		1,360	0	225	0	1,580
CLARK		293	0	78	33	404
COLUMBIA		280	0	967	0	1,250
CRAWFORD		449	0	98	0	547
DANE		0	0	14,600	0	14,600
DODGE		10	12	1,940	15	1,970
DOOR		0	683	6	0	689
DOUGLAS		2	0	Ō	Ö	2
DUNN		0	0	612	0	612
EAU CLAIRE		3,880	0	401	Ö	4,280
FLORENCE		58	0	0	Ō	58
FOND DU LAC	2	175	34	3,500	17	3,730
FOREST		125	0	0	0	125
GRANT		69	Ō	1,190	0	1,260
GREEN		0	0	1,190	0	1,190
GREEN LAKE		0	0	549	0	549
IOWA		0	0	5 <b>25</b>	0	525
IRON		66	0	0	0	66
JACKSON		225	Ō	59	Ö	284
JEFFERSON		0	0	2,860	0	2,860
JUNEAU		0	0	441	0	441
KENOSHA		29	86	44	0	160
KEWAUNEE		0	205	104	0	310
LA CROSSE		5,060	0	304	0	5,360
LAFAYETTE		0	0	454	0	454
LANGLADE		478	0	0	0	478
LINCOLN		606	0	0	0	606
MANITOWOC		0	301	0	ő	301
MARATHON		4,720	0	0	74	4,790
MARINETTE		234	Ö	226	0	460
MARQUETTE		0	0	44	5	49

TABLE 5. SUMMARY OF 1979 PUMPAGE FROM AQUIFERS IN WISCONSIN--CONTINUED

COUNTY	SAND	AND GRAVEL	SILURIAN	SANDSTONE	PRECAMBRIAN	ANNUAL PUMPAGE IN MILLIONS OF GALLONS
ACTION THEE		110	0	0	0	110
MENOMINEE MILWAUKEE		0	0 110	0 74	0	110 184
MONROE		0	0	1,080	0 0	1,080
OCONTO		126	0	438	0	564
ONEIDA		916	0	438	0	916
OUTAGAMIE		124	0	1,440	0	1,560
OZAUKEE		206	655	653	0	1,510
PEPIN		93	0	28	0	1,310
PIERCE		0	0	611	0	611
POLK		219	0	552	0	771
PORTAGE		1,640	0	0	11	1,650
PRICE		330	ő	ő	0	330
RACINE		29	15	989	Ŏ	1,030
RICHLAND		0	0	301	ő	301
ROCK		5,840	0	1,590	0	7,420
RUSK		237	Ö	0	0	237
ST. CROIX		18	Õ	807	0	8 <b>2</b> 5
SAUK		254	Ö	963	0	1,220
SAWYER		22	Ö	94	0	116
SHAWANO		194	ő	624	16	833
SHEBOYGAN		167	899	0	0	1,070
TAYLOR		239	0	0	0	239
TREMPEALEAU	T	83	0	522	0	605
VERNON	,	0	Ö	478	0	478
VILAS		139	Ö	0	0	139
WALWORTH		1,340	ő	821	107	2,270
WASHBURN		197	ő	68	0	265
WASHINGTON		1,440	666	343	Õ	2,450
WAUKESHA		911	422	5,840	0	7,170
WAUPACA		1,860	0	0	Ö	1,860
WAUSHARA		59	Ö	40	2	102
WINNEBAGO		0	Ö	722	0	722
WOOD		2,160	Ö	0	32	2,190
STATE TOTAL	.s	37,300	4,840	53,400	<del>591</del>	96,100

NOTE: DATA ROUNDED TO THREE SIGNIFICANT FIGURES; FIGURES MAY NOT ADD TO TOTALS BECAUSE OF INDEPENDENT ROUNDING.